

Sub E1

36. A method for controlling a camless valve assembly in an engine, said engine having an engine cylinder, said valve assembly having a valve communicating with said cylinder, said method comprising:

opening said valve using an electrically driven ball-screw device at a first opening rate to control gas flow into said cylinder during a first combustion cycle of said cylinder; and,

opening said valve using said ball-screw device at a second opening rate to control gas flow into said cylinder during a second combustion cycle of said cylinder.

Please add new claims 37-44.

Sub D3

37. An electromechanical valve assembly for an internal combustion engine, said engine having an engine cylinder, said assembly comprising:

a rotor centered about a first axis having a bore extending generally axially therethrough;

a stator operatively disposed about said rotor for producing a torque to cause rotation of said rotor about said first axis;

a valve having a valve stem and a valve head, said valve stem configured to move upwardly when said rotor rotates in a first direction to move said valve head against a valve seat in said engine to prevent gas flow into or out of said engine cylinder; and,

a position sensor for determining a rotational position of said rotor.

38. An electromechanical valve assembly for an internal combustion engine, comprising:

a rotor centered about an axis;

a stator disposed around said rotor producing a torque to cause rotation of said rotor about said axis; and,

a valve member threadably engaging said rotor, said member moving towards a valve seat of an engine cylinder when said rotor rotates in a first direction to restrict flow into or out of said cylinder.

39. The electromechanical valve assembly of claim 38 further comprising a position sensor generating a signal indicative of a rotational position of said rotor.

40. The electromechanical valve assembly of claim 38 further comprising a position sensor generating a signal indicative of an axial position of said valve member.

41. An electromechanical valve assembly for an internal combustion engine, comprising:

a valve member;

an electrically actuated ball-screw device operably coupled to said valve member, said device moving said member towards a valve seat of an engine cylinder.

42. The electromechanical valve assembly of claim 41 further comprising an anti-twist guide coupled to said valve member for preventing rotation of said valve member.

43. The electromechanical valve assembly of claim 41 further comprising a position sensor generating a position signal indicative of an axial position of said valve member.

sub 1
Q3 44. A method for controlling an electromechanical valve in an internal combustion engine, comprising:

controlling movement of a valve member based on an electrical control signal;

generating a position signal indicative of a position of said valve member; and,

commanding said valve member to stop when said position signal indicates said valve member is proximate a valve seat of an engine cylinder.